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Zero Retries is an independent newsletter about technological innovation in Amateur Radio. Zero Retries promotes Amateur Radio as (literally) a license to experiment with radio technology.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Request To Send

Typos - Post Publication Cleanups
Typos - I've had a few… As well as misstatements, missing words, etc.

One of the features of Substack's system is that creating content there generates email newsletters (its primary purpose) *and* a blog post (including an RSS feed for us RSS users).

Like you, I read Zero Retries as an email after it publishes at 15:30 Pacific each Friday. Inevitably, in the email version, I spot typos, misstatements, missing words, etc. which I usually fix on the web version of that issue. It's worth the trouble of doing so as eventually these issues will get archived including my promise to DLARC to create PDF versions that can be archived there.

Ria Jairam N2RJ Sanction by ARRL Board
Regarding my Zero Retries 0082's Request To Send regarding the ARRL Board's sanction of ARRL Hudson Division Director Ria Jairam N2RJ, I had a series of email exchanges with my ARRL (Northwestern) Division Director Mike Ritz W7VO. Our email exchange wasn't on the record, but I'll summarize W7VO's position (*my words*) as "for better or worse, decision made, moving on".

In our email exchange, I said, in part:

> In the end, the fallout of that bad decision is going to hurt ARRL. Perhaps it will hurt minimally, or it may hurt severely - too soon to tell.
>
> …
>
> The ARRL Board is on the wrong side of history on this issue - it's being hyper protective and insular when it should be looking at the bigger picture.

One *cuts to the heart of the matter* statement to an ARRL Director that I was copied on:

> The question that this incident raises in my mind, and presumably the minds of potential future ARRL members is: Is this *really* an organization that I want to be part of?

Good point! I've resigned my participation in other organizations not because I think my resignation could alter the organization's decisions, but simply because my conscience wouldn't permit me to remain involved, even passively, as in *Not in **my** name, you don't!* Thus it will be an interesting moment in a few months when I receive the annual notice that my ARRL membership is about to expire. I'll let you know what I decide.

Personal DLARC Update
Four more boxes (thirteen to date) of Amateur Radio media left the N8GNJ Labs archives this week on the way to the Digital Library of Amateur Radio & Communications.

de Steve N8GNJ

The Antenna(s) Problem

New 144 / 222 / 440 MHz antenna at N8GNJ Labs - photo by Steve Stroh N8GNJ

As much as I love experimenting with radios, and especially data communications over radio, to me, dealing with antennas is merely a necessary evil. Thus I get that it's tempting to put most of one's "radio experimentation" efforts into the *radio*, rather than the antenna. But, eventually you learn that in an optimally functioning radio system, a reasonable antenna, installed reasonably high and in the clear, is generally more important[1] than the radio .

Amateur Radio Operators of a certain vintage take it for granted that our Amateur Radio stations require multiple antennas to accommodate various radios of differing functionality. But that seemingly mundane "fact" is a huge differentiation between older Amateur Radio Operators and new Amateur Radio Operators. The latter rightly say "How do I put an antenna up into the air?" Unstated, but implied is "How do I do it *safely*, with minimal long term impact to my apartment / condo / house?".

"Back in the day", "antenna / tower parties" were common. A small group of one's Amateur Radio buddies would gather at the home where the new antenna / tower is needed. Some nimble person would do the difficult work of getting an antenna mounted on the roof, or erecting a tower and then installing an antenna onto the tower. The rest were ground crew - tugging on ropes, keeping an eye out for dangerous obstacles, keeping the beer cold, cooking the burgers, etc.

My perception is "antenna / tower parties" are mostly a thing of the past. The tribal knowledge of "antenna / tower parties" is rapidly aging out of the Amateur Radio population. Another understandable factor is that there is inevitably a significant risk of someone injuring themselves on your property and the possibility of lawsuits and denied insurance claims - putting up "structure" can argued to be a job for professionals.

I recently had breakfast with a small group of Amateur Radio Operators, and I mentioned that I finally got a new antenna, with new feedline, 30 feet in the air, and it was *barely* doable by me on a ladder with my wife assisting me on the ground. As the conversation turned to my accomplishment, all seven of us confessed to each other that our days of scampering up towers and roofs, and ladders were behind us. Admittedly, with various medical issues, ***I*** should not have been on a 10 foot ladder… but I *really* wanted to be back on the air for VHF and UHF.

I'll have a full description of my new antenna project, detailed descriptions of what I used, including photographs, on my n8gnj.org blog as soon as the project is complete. Routing the coaxial cable to the radio area in N8GNJ Labs remains to be done.

Once the antenna was in the air, I had a blinding moment of clarity (Part 1) - *it was hard work* to get that *one* antenna 30 feet into the air. Keep in mind that in my area, Whatcom County, Washington, 60 mile per hour (MPH) winds occur. I *think* I've done a reasonable job securing this 30 foot antenna pole, but I won't *know* until the winds test my installation.

As my attention turned to the next task of routing the coaxial cable I began thinking… *what radios will I connect to that coax?* My new antenna is a Comet CX-333 "tri-bander" - 144 / 222 / 440 MHz[2], so I could connect three different radios to it. But *which* radios?

Then it was time for blinding moment of clarity (Part 2) - if the decision of what radios to connect to my (currently) one antenna is hard *for me*, what must such a decision be like for a new or prospective Amateur Radio Operator? Here are some "what radio do I connect to my antenna" decision points:

- DMR radio? There are lots of DMR repeaters these days, and all DMR radios can do FM, but DMR radios don't have "flat audio" ("data") connections to be able to do interesting higher speed data modes. DMR radios also require "code plugs" to be functional and the learning curve for code plugs and other DMR minutiae is steep.
- FM radio? The Yaesu FTM-6000R that *does* have a "flat audio" connection to be able to do interesting higher speed data modes… but not DMR.
- Few Amateur Radios these days are single-band, so your antenna connections have to accommodate both the 144 MHz and 440 MHz outputs of a 144 / 440 MHz radio[3]. If you use a triplexer to break out antenna connections for 144 / 222 / 440 MHz, you end up having to use a duplexer to take the single 144 / 440 MHz output on the radio into the 144 MHz port and the 440 MHz antenna port of the triplexer. Yes, complicated, and there's some signal / power loss with all that conversion of the duplexer and triplexer.

- And numerous other complicated radio decisions.

My choice of radios for this new 144 / 222 / 440 MHz antenna *at this moment* is[4]:

- 144 / 440 MHz - Kenwood TM-V71A. The 440 MHz section is mostly used for voice repeaters, and the 144 MHz section is used for data communications.
- 222 MHz - My venerable Icom IC-38A for voice repeaters.

I have single band 144, 222, and 440 MHz radios for data use that will eventually be installed in place of the above.

Returning to the difficulty of installing antennas… Antenna / tower parties aren't impossible these days, they're just tougher to organize, and more expensive. In my case, instead of merely springing for hot burgers and cold beers, an antenna / tower party will end up costing a few *hundred* dollars and will arrive on a trailer from an equipment rental store in the form of a scissor lift or telescopic boom lift. Heck… with those, perhaps antenna work might even be fun?

Nah, for me installing antennas is still just a necessary evil to experiment with radios.

But, with proper preparation, a scissor lift or telescopic boom lift will make short work of installing at least four more 30 foot antennas along the back of N8GNJ Labs in a day or two.

*Postscript - Substack flagged this issue of Zero Retries as **(!) Post too long for email**. Thus, some severe editing was necessary to send this issue via email. If you'd like to see the article with all the original detail, it's published on SuperPacket - Zero Retries 0083 - The Antenna(s) Problem.*

Leave a comment

Microblogging via Amateur Radio

Jeff Davis KE9V and Alexander von Obert DL4NO both pointed out the above interesting video by Julian White OH8STN. It's an… idea… and we (Amateur Radio Operators focused on data operations) used to be quite capable of this sort of thing. Some past implementations of this idea that come readily to mind are:

- When Radio Teletype (RTTY) made the jump from electromechanical teletypes to microprocessor-based units, one improvement was a "brag file". I don't know the specifics (it was a bit before my time) but the idea was that you could send a command to another station that had a microprocessor-based RTTY system, and (if enabled), the other station's RTTY system would automatically transmit the contents of a file, usually the "bragging" details of the station - antenna system, radio details, location, favorite hobbies (besides Amateur Radio), name of the cat, etc. The contents of the file used to be called a brag *tape* (as in paper tape) in the era of electromechanical teletypes and paper tape readers, used to need to be loaded manually. Although I can't find a definitive reference, I believe the electronic version was called Message Storage Option (MSO).
- Operating a Bulletin Board System (BBS). There's even a minimal BBS built into Kantronics TNCs. If all you need is a minimal BBS, it's tough to beat a Kantronics KPC-3.
- A remote command on UNIX systems called finger, which was included in early Amateur Radio TCP/IP applications such as KA9Q's NET and NOS.
- Some Amateur Radio data systems implement an "allcall" function which will cause all compatible systems on the frequency to display text on their screen (when normally they would display only messages for their callsign).
- Usenet was possible via packet radio - slowly.
- FidoNet was also possible via packet radio - slowly.
- RadioMirror and FLAMP "flood" file distribution protocols, etc. could be used to distribute text files that contain news.

- PACSAT Broadcast Protocol - Has provisions for “broadcasting” bulletins

Thus, this isn’t a new problem… it just hasn’t been addressed with such a capability in these newer modes highlighted by OH8STN, which (to date) are intended for person to person text chat and email.

Leave a comment

ZR > BEACON

- Experimental Radio News 7 - *UAP detection, wireless power, asset tracking, shortwave lobbying*. If you enjoy Zero Retries, you’ll enjoy Experimental Radio News - *always* excellent work by Bennet Z. Kobb AK4AV.

- The New RNode Ecosystem Is Here
  This release marks quite a milestone in the continued development of the RNode concept. What started, almost five years ago, as a single open source communications hardware device, with an open source and hackable firmware, has now developed into a multiplatform ecosystem for creating all kinds of communications devices.
  I lack basic competence about this impressive accomplishment to provide any context beyond what’s written in the above link. RNode, and the supporting Reticulum protocol is an amazing accomplishment by one talented person. My thanks to Steve Monsey N0FPF for the pointer. RNode and Reticulum are high on the “must study more” queue.

- Amateur Satellite FalconSAT-3 Nears Reentry
  By the time you read this, FalconSAT-3 will have de-orbited. It was a unique Amateur Radio satellite - definitely Zero Retries Interesting. It was built in an era that emphasized packet radio technology. It was an orbital Bulletin Board System - you could upload a message in one part of the orbit to be downloaded in another part of the orbit. It also used 9600 bps GMSK data transmission, downlinked on 435 MHz and uplinked on 145 MHz full duplex. One of the most unique aspects of FalconSAT-3 was its use of PACSAT Broadcast Protocol (PBP) which is one of those “lost art” technologies in Amateur Radio that we could be making a lot better use of in the 2020s with quieter, less used VHF / UHF bands and the desire for non-Internet messaging and “Microblogging” (see story above). Hopefully there will be more FalconSATs.

- Amateur Radio Computer Networking Conferences (CNCs) and Digital Communications Conferences (DCCs) Now in Digital Library of Amateur Radio & Communications (DLARC). There were a lot of the CNC / DCC information online already, but a key difference in getting this information into Internet Archive is that IA’s process does a lot more than just provide a PDF viewable version. Each document (that has text) is run through a very powerful Optical Character Recognition (OCR) process that makes the text accessible. A lot of this information was available only as image PDFs - the text wasn’t accessible, and now it is. I hope other organizations will follow suit with their archival information.

Updata

- In Zero Retries 0078, I said:
  The latest update from [CaribouLite RPi HAT] on 2022-10-25 indicated that shipments would begin in December, 2022. Nothing heard since then. I queried Crowd Supply about this lack of status updates on that project and Crowd Supply has not replied.
  On 2023-01-03, an update was posted - delivery possibly in February. In my opinion, when they knew they would miss their stated “December, 2022” goal, they could have… should have… posted this update. They just didn’t understand how fragile trust is in crowdfunding, and thus *communicate, Communicate, COMMUNICATE!* when there is a big change in status like missing dates.

- The Bridgecom Systems BCM-220 now officially in stock - $349 each. This is a 30 watt 222-225 MHz radio that has a “flat audio” connection (with an unusual connector5) for higher speed data operation. One unique feature is that it will operate in 219-220 MHz, which has some unique requirements.

Feedback Loop

Great comments on Zero Retries 0082:

- **Ren Roderick**: *Imagine the combination of Automatic Link Establishment (ALE) and Artificial Intelligence.*
  I had forgotten about the existing technology of ALE - adding to the next Omnibus!

- **John Kreno N3XKD and Nate Bargmann** offered their thoughts on Ria Jairam N2RJ’s sanctioning by the ARRL Board.

- **Dan Coker**: *Embedded AI is already present in the latest generation of closed circuit television cameras.*

Email:

- Regarding AI in radio [Zero Retries 0082], the [Artificial Intelligence Radio - Transceiver (AIR-T)] was from over four years ago:
  https://www.crowdsupply.com/deepwave-digital/air-t

Join the *Fun* on Amateur Radio

If you’re not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with wireless

technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to anyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- Pseudostaffers Dan Romanchik KB6NU and Jeff Davis KE9V for continuing to spot, and write about "Zero Retries Interesting" items on their blogs that I don't spot on my own.
- Amateur Radio Weekly consistently surfaces "Zero Retries Interesting" stories.
- Andreas Spiess HB9BLA's YouTube Channel - HB9BLA Wireless features Zero Retries Interesting content.
- The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

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Zero Retries (N8GNJ) is on Mastodon - n8gnj@mastodon.radio - just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc. I don't use such information in any way other than seeing that most subscribers actually do read Zero Retries.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog - *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog - *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs - Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted in beautiful Bellingham (The City of Subdued Excitement), Washington, USA.

2023-01-27

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1

Just one of the many things you learn empirically about radio technology as an Amateur Radio Operator.

2

In my opinion, it's too much work, tower / pole space is too precious, and in general life is too short to put up single-band antennas. In this era, antennas should work for you as much as possible!

3

If you don't do so, even if you intend to use a dual band radio only on one band such as 144 MHz… it's *likely* that *eventually* you'll accidentally transmit on the other band - 440 MHz at full power (25 or 50 watts) into an antenna input for 144 MHz risks damaging the radio.

4

I tried to describe the antenna / triplexer / duplexer connections for these two radios in text and it got horribly convoluted. I need a reasonable sketch / diagramming tool.

5

Masters Communications is developing the BCM-6 adapter for this unusual connector.